

What Is Claimed Is:

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1. An image data sorting device comprising:
  - a characteristic value extraction unit that extracts a characteristic value of an image data piece from the image data piece;
  - a relation evaluation unit that evaluates a mutual relation between the characteristic values that the characteristic value extraction unit extracts from plural image data pieces;
  - a clustering unit that executes clustering to events expressed by the characteristic values of the plural image data pieces on the basis of an evaluation result of the relation acquired by the relation evaluation unit; and
  - a sorting register unit that sorts the plural image data pieces on the basis of a result of clustering by the clustering unit.
2. An image data sorting device according to Claim 1, wherein:
  - the characteristic extraction unit extracts, as the characteristic value of the image data,  $n$  types of characteristic value vectors expressed by an  $I_j$  dimensional vector ( $j = 1, 2, \dots, n$ , here,  $1 \leq I_j, 1 \leq n$ ) from the image data; and
  - the relation evaluation unit, synthesizing  $n$  types of the characteristic value vectors as to each of the  $n$  types of the characteristic value vectors that the characteristic value extraction unit extracts from the plural image data pieces, evaluates the relation between the image data pieces in a synthesis result.
3. An image data sorting device according to Claim 1, wherein the clustering unit executes clustering by means of a non-hierarchical method based on a cluster number.

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4. An image data sorting device according to Claim 1, wherein the clustering unit executes clustering by means of a hierarchical method that joins clusters on the basis of the relation between the clusters.

5. An image data sorting device according to Claim 1, wherein the clustering unit executes clustering by means of a fuzzy technique that employs the fuzzy theory.

6. An image data sorting device according to Claim 1, wherein the clustering unit executes clustering by means of a crisp technique that does not employ the fuzzy theory.

7. An image data sorting device according to Claim 1, wherein the clustering unit includes a cluster number specifying unit that specifies a cluster number when executing clustering.

8. An image data sorting device according to Claim 1, further comprising:  
an image storage unit that stores plural image data pieces; and  
an image management unit that manages the plural image data pieces stored in the image storage unit on the basis of a sorting result by the sorting register unit.

9. An image data sorting device according to Claim 8, wherein the image management unit manages the plural image data pieces stored in the image storage unit on the basis of the sorting result by the sorting register unit and attribute information relating to the image data pieces, which are given to the plural image data pieces.

10. An image data sorting device according to Claim 8, wherein, when the image storage unit stores a specific number of image data pieces, the clustering unit and

the sorting register unit execute clustering and sorting of the image data pieces stored in the image storage unit.

11. An image data sorting device according to Claim 8, wherein the clustering unit and the sorting register unit execute clustering and sorting of the image data pieces stored in the image storage unit each time a specific period of time passes.

12. An image data sorting device according to Claim 8, wherein, when there is a new image data piece to be stored in the image storage unit after clustering and sorting of the image data pieces stored in the image storage unit, the clustering unit and the sorting register unit execute sorting of the new image data piece in such a manner that the new image data piece belongs to a cluster having the highest relation among existing clusters relating to the image data pieces stored in the image storage unit.

13. An image data sorting device according to Claim 12, wherein the clustering unit and the sorting register unit execute sorting of the new image data piece on the basis of the relation with the characteristic value acquired from the center of gravity of the existing clusters relating to the image data pieces stored in the image storage unit.

14. An image data sorting device according to Claim 12, wherein the clustering unit and the sorting register unit execute sorting of the new image data piece on the basis of a center value of the relations between the characteristic value of the new image data piece and the characteristic values of the image data pieces each stored in the image storage unit.

15. An image data sorting device according to Claim 8, wherein, when more than a specific number of image data pieces are added in the image storage unit after sorting by the sorting register unit, the clustering unit and the sorting register unit destroy the existing sorting and execute clustering and sorting of all of the image data pieces stored in the image storage unit.

16. An image data sorting device according to Claim 8, wherein, when a specific time passes after sorting by the sorting register unit, the clustering unit and the sorting register unit destroy the existing sorting and execute clustering and sorting of all of the image data pieces stored in the image storage unit.

17. An image data sorting device according to Claim 1, further comprising an image output unit that outputs image data pieces located near the center of each cluster, of the image data pieces after clustering by the clustering unit and sorting by the sorting register unit having been executed.

18. An image data sorting device according to Claim 1, further comprising an image output unit that outputs image data pieces having a high relation with image data pieces located near the center of each cluster, of the image data pieces after clustering by the clustering unit and sorting by the sorting register unit having been executed.

19. An image data sorting device according to Claim 17, wherein the image output unit outputs only the image data pieces relating to a designated cluster.

20. An image data sorting device according to Claim 17, wherein, after clustering by the clustering unit and sorting by the sorting register unit have been executed, when clustering by the clustering unit and sorting by the sorting register unit

are executed again, the image output unit again outputs image data pieces after being sorted again.

21. An image data sorting method comprising the steps of:

extracting a characteristic value of an image data piece from the image data piece;

when extracting characteristic values from plural image data pieces, evaluating a mutual relation between the characteristic values each;

executing clustering to events expressed by the characteristic values of the plural image data pieces on the basis of an evaluation result of the relation; and

sorting the plural image data pieces on the basis of a result of the clustering.

22. An image data sorting method comprising the steps of:

extracting  $n$  types of characteristic value vectors expressed by an  $I_j$  dimensional vector ( $j = 1, 2, \dots, n$ , here,  $1 \leq I_j, 1 \leq n$ ) from image data pieces;

when extracting  $n$  types of the characteristic value vectors from plural image data pieces, synthesizing  $n$  types of the characteristic value vectors as to each of the  $n$  types of the characteristic value vectors, and evaluating a mutual relation between the image data pieces in a synthesis result;

executing clustering to the characteristic value vectors of the plural image data pieces in accordance with an evaluation result of the relation; and

sorting the plural image data pieces on the basis of a result of the clustering.

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